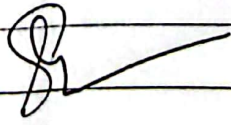


SPL1 Project Proposal Form, 2022
Institute of Information Technology (IIT)
University of Dhaka

Student's Name:	Sampad Sikder		
Student's Roll:	1219	Phone:	01841482115
<p>Project Description: Implementation of a Matrix factorization technique where a matrix $X_{m \times n}$ is factorized into two matrices $A_{m \times k}$ and $B_{k \times n}$. Here k will be defined by user input. The entries of matrix $A_{m \times k}$ and $B_{k \times n}$ are initialized using Gaussian distribution. Using multiplicative update, we will try to converge towards the original matrix minimizing the error. The multiplicative update will update the matrices $A_{m \times k}$ and $B_{k \times n}$ using the formula:</p> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 10px;"> $H = H \frac{(W^T V)}{(W^T W H)}$ $W = W \frac{(H^T V)}{(H^T H W)}$ (Multiplicative update equation) </div> <p>Where the matrix V is factorized into H and W. The error will be calculated following Frobenius norm. The resultant matrix will be an approximation of the original matrix $X_{m \times n}$ when the error is below a certain value(ϵ). In this project, the following implementations are to be done:</p> <ol style="list-style-type: none"> 1. Making a random number generator function using Gaussian distribution. 2. Matrix multiplications. 3. Calculating the determinant of a matrix. 4. Finding the transpose of a matrix. 5. Finding the inverse of a matrix. 			
<p>Languages or Tools to be used: C++, Java</p>			
<p>Supervisor's Name: <u>Dr. Mohammad Shoyaib</u> </p> <p>Signature of the supervisor: _____</p> <p>Date: <u>06/02/2022</u></p>			

Before the Midterm Presentation:

I confirm that the progress is satisfactory and I am forwarding it for midterm presentation.

Signature of the supervisor: _____

Date: _____

Midterm Presentation Feedback: